

WE CLAIM:

1. A system for interfacing with an implanted medical device, the system comprising:

a microphone,

5 a speech recognition circuit coupled to the microphone and adapted to recognize an audio signal from the microphone, the audio signal corresponding to one of a subset of commands from a set of commands and each command corresponding to a task to be performed on the implanted medical device, the speech recognition circuit further adapted to convert the audio signal into a selection code and match the selection code to one of the subset of commands;

a display device;

a processor arrangement coupled to the speech recognition circuit and to the display device, the processor arrangement configured to receive data indicative of an implanted medical device state and select the subset of commands as a function of the device state, the processor arrangement configured to display the device state data and the subset of commands, and generate a control signal in response to the selection code match; and

a medical data processing instrument coupled to the processor arrangement and adapted to, in response to the control signal, execute the one of the subset of commands and to display data generated in response to execution of the one of the subset of commands.

2. The system of claim 1, further including a bandpass amplifier circuit coupled to the microphone and adapted to reject ambient background noise signals that are not speech generated.

3. The system of claim 1, further including a noise suppression circuit coupled to the microphone and adapted to produce a noise-suppressed speech signal in response to noise suppression information received from the microphone.

5 4. The system of claim 1, wherein the speech recognition circuit further includes a memory arrangement configured to store the set of commands and the device state data and adapted to be accessed by the processor upon recognition of the audio signal received from the microphone.

10 5. The system of claim 4, wherein the memory arrangement is adapted to store the subset of commands corresponding to at least one of a plurality of implanted device states.

15 6. The system of claim 4, wherein the speech recognition circuit further includes a control signal circuit adapted to generate control signals for the medical data processing instrument in response to the selection code match.

20 7. The system of claim 1, wherein the medical data processing instrument includes a pacing system analyzer.

8. The system of claim 1, wherein the medical data processing instrument includes an implanted medical device programming unit adapted to interrogate and program the implanted device.

9. The system of claim 1, wherein the display includes a display screen adapted for use by a user of the medical data processing instrument and coupled to the speech recognition circuit and the processor arrangement.

10. The system of claim 9, wherein the microphone is a unidirectional microphone mounted on the display screen and coupled to the medical data processing instrument, thereby reducing background noise.

11. The system of claim 1, wherein the microphone is a unidirectional microphone arrangement adapted to be donned and steered by a user of the medical data processing instrument, thereby reducing background noise.

12. The system of claim 10, wherein the microphone is adapted to be directionally steered by a user of the medical data processing instrument for improved audio signal clarity.

13. The system of claim 4, wherein the speech recognition circuit and the processor are adapted to interact with a user to generate the set of commands to be stored in the memory arrangement.

14. The system of claim 13, wherein the processor is adapted to receive and validate the user via a user selection code, the user selection code providing access to differing levels of commands for controlling the data processing instrument.

15. The system of claim 1, further comprising an audio circuit coupled to the speech recognition circuit configured and arranged to produce an audio signal confirming receipt of a voice selected command from the subset of commands.

5 16. The system of claim 15, wherein the audio circuit is configured and arranged to produce an audio signal representing the device state with the subset of commands.

10 17. The system of claim 1, further comprising an audio circuit coupled to the speech recognition circuit configured and arranged to reproduce and repeat a voice selected command and to produce an audio signal confirming execution of the voice selected command.

15 18. The system of claim 1, wherein the speech recognition circuit is coupled to the medical data processing instrument via a communications network.

19. A system for interfacing with an implanted medical device, the method comprising:

means for receiving data indicative of an implanted medical device state;

20 means for selecting a subset of commands from a set of commands for performing tasks on the implanted medical device, the subset being selected as a function of the device state;

means for displaying the device state data along with the subset of commands;

25 means for converting an input audio signal from a microphone into a selection code, the input audio signal corresponding to one of the subset of commands;

means for matching the selection code to one of the subset of commands;

means for executing the one of the subset of commands; and

means for receiving data generated by a medical data processing instrument in response to execution of the one of the subset of commands.

- 5 20. A method for interfacing with an implanted medical device, the method comprising:
- receiving data indicative of an implanted medical device state;  
selecting a subset of commands from a set of commands for performing tasks on the implanted medical device, the subset being selected as a function of the device state;  
displaying the device state data along with the subset of commands;  
10 converting an input audio signal from a microphone into a selection code, the input audio signal corresponding to one of the subset of commands;  
matching the selection code to one of the subset of commands;  
executing the one of the subset of commands; and  
receiving data generated by a medical data processing instrument in response to  
15 execution of the one of the subset of commands.

21. The method of claim 20, wherein the step of executing the one of the subset of commands includes the step of validating speech sets received via a memory arrangement coupled to the processor, the memory arrangement having the set of  
20 commands stored therein.

22. The method of claim 20, further comprising the step of producing an audio signal representing the device state with the subset of commands before the step of executing the one of the subset of commands.

- 25 23. The method of claim 20, further comprising the step of suppressing noise from the input audio signal before converting the audio signal into a selection code.

24. The method of claim 20, further comprising the steps of:  
configuring the set of commands via a plurality of voice commands provided by a  
user of the medical data processing instrument before the step of receiving data indicative  
of the device state; and

5 storing the set of commands in a memory arrangement for display.

25. The method of claim 24, further comprising the step of receiving and  
validating a user via a user selection code, the user selection code providing access to  
differing levels of commands for controlling the processing instrument before the step of  
10 receiving the voice selected command.

26. A method for controlling a medical data processing instrument that  
interfaces with an implanted medical device, the method comprising:

15 displaying an implanted device state data along with a subset of commands of a  
set of commands;

receiving a voice command selected from one of the subset of commands;

processing the selected command via a processor and a memory arrangement, the  
memory arrangement including the set of commands along with a set of control signals,  
the control signals used for controlling the data processing instrument;

20 transmitting to the data processing instrument the control signal for executing the  
selected command for performing a task on the implanted device; and

displaying device state data generated by the data processing instrument in  
response to executing the selected command.

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27. The method of claim 26, further comprising the step of generating the set of commands to be stored in the memory arrangement via voice commands provided by a user of the data processing arrangement before the step of displaying the device state data.

28. The method of claim 27, further comprising the step of receiving and authenticating a user selection code for providing access to differing levels of command options before the step of receiving the voice command.

29. The method of claim 26, further comprising the step of producing a noise-suppressed speech signal corresponding to noise suppression information received after the voice command is received.

30. A system for controlling a medical data processing instrument that interfaces with an implanted medical device, the system comprising:  
means for displaying an implanted device state data along with a subset of commands of a set of commands;  
means for receiving a voice command selected from one of the subset of commands;  
means for processing the selected command via a processor and a memory arrangement, the memory arrangement including the set of commands along with a set of control signals, the control signals used for controlling the data processing instrument;  
means for transmitting to the data processing instrument the control signal for executing the selected command for performing a task on the implanted device; and  
means for displaying device state data generated by the data processing instrument in response to executing the selected command.